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- (71) Applicant: KONINKLIJKE PHILIPS ELECTRONICS N.V. [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).
- (72) Inventors: KEMINK, Joost; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). SAGAR, Richard; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).
- (74) Agent: GROENENDAAL, Antonius, W., M.; Internationaal Octrooibureau B.V., Prof Holstlaan 6, NL-5656 AA Eindhoven (NL).
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**WO 01/24473 A1**

(54) Title: PDA HAS WIRELESS MODEM FOR REMOTE CONTROL VIA THE INTERNET

(57) Abstract: A PDA is combined with a wireless modem to enable remote control of CE equipment via the Internet and a local home server.

PDA has wireless modem for remote control via the internet

## FIELD OF THE INVENTION

The invention relates in particular to remote control of consumer electronics (CE) equipment.

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## BACKGROUND ART

Remote control units are widely known. An example is the Pronto manufactured by Royal Philips Electronics. The Pronto is a so-called universal programmable remote control unit. It enables storing the IR codes of practically any existing consumer electronics (CE) apparatus. The Pronto has an LCD with touch screen functionality as a user-interface. The control functionalities of the Pronto can be fully customized by the user him/herself. The Pronto communicates with nearby CE equipment using infra-red (IR) radiation.

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## SUMMARY OF THE INVENTION

The invention takes the concept of "remote control" within the CE context a step further. The inventors propose to provide fully remote control to the user regardless of the distance between the equipment to be controlled and the user. The inventors also propose a two-way communication between the remote control and the equipment to be controlled.

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To this end, the invention provides an information processing system that has a handheld computing device, e.g., a PDA, (Personal Digital Assistant) with a user-interface and a wireless modem coupled to the handheld. The wireless modem enables communication with a server via a data network such as the Internet. A control network is coupled between the server and controllable equipment. The handheld is now capable of functioning as a wireless remote control device for the equipment via the Internet and the server. The system may comprise a video camera together with hardware and software to create a formatted still image suitable for being displayed on the handheld device. The user can now instruct retrieval of a still image from the server via the Internet. This application serves as, e.g., a security system that enables the remote user to monitor his/her front porch, or to monitor a

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child by way of a remote (or fall-back) baby-sit. The user-accessibility of equipment is guaranteed by the ubiquity of the Internet, thus enabling to expand the range of control and monitoring capabilities for a mobile user.

Incorporated by reference herein are the following patent documents:

- 5 - U.S. serial no.60/156,087 (Attorney docket PHA 23,783P) filed 9/24/99 for Martin Freeman and Bonghan Cho for REMOTE INITIATES RETRIEVAL OF CONTROL CONFIGURATION. This document relates to a programmable remote control unit that is capable of initiating retrieval of a control configuration from a storage device external to the unit, The unit comprises a memory to store the retrieved control configuration; a display for  
10 display of icons representing the configuration; and a touch screen for entering a selection based on the icons displayed. The storage device is a component a CE apparatus. By storing or backing-up the control configuration for a specific apparatus in the apparatus itself the remote is made truly universally programmable.
- U.S. serial no. 09/160,490 (attorney docket PHA 23,500) filed 9/25/98 for Adrian Turner,  
15 Simon Pearce, David Eves and Allan Timms for CUSTOMIZED UPGRADING OF INTERNET-ENABLED DEVICES BASED ON USER-PROFILE, and
- U.S. serial no. 09/189,535 (attorney docket PHA 23,527) filed 11/10/98 for Eugene Shteyn  
20 for UPGRADING OF SYNERGETIC ASPECTS OF HOME NETWORKS, both of which relate to a server system that maintains a user profile of a particular end-user of consumer electronics network-enabled equipment and a data base of new technical features for this type of equipment. If there is a match between the profile and a new technical feature, and the user has indicated he/she is willing to receive the information about updates or sales offers, the user gets notified via the network of the option to obtain the feature. Synergy is detected between pieces of equipment of the user in order to notify him/her of further possibilities of  
25 using or expanding his/her equipment.

## BRIEF DESCRIPTION OF THE DRAWINGS

The invention is explained by way of example and with reference to the accompanying drawings, wherein Fig.1 is a block diagram of a system in the invention.

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## PREFERRED EMBODIMENTS

The invention is explained below within the context of two examples. A first example is the use of the remote control via the Internet to turn on and turn off a lamp. The second example relates to retrieving an image from a home server.

Fig.1 is a block diagram of a system 100 of the invention. System 100 comprises a hand-held device 102 such as a personal digital assistant (PDA) ,e.g., a PalmIIIx manufactured by 3COM or a Windows CE-based handheld, that is connected to a data network 106, e.g., the Internet, via a wireless modem 104. Modem 104 is, for example, a Minstrel or a Ricochet. The Minstrel marketed by Novatel Wireless is a two-way wireless modem for a PDA that lets the user browse the Web and receive email, among other things. In a more general sense, a wireless modem like the Minstrel or Ricochet provides the handheld device with an IP address that can be used by any type of application that uses the Internet for communication (within limitations of throughput, latency and coverage). The Minstrel uses a technology referred to as Cellular Digital Packet Data (CDPD) that is supported by the cellular service providers. Web surfing is limited to a CDPD speed cap of 19.2-kbps. The Ricochet from Metricom has a faster connect rate, in the 28.8K-bps range, but it is supported in only three metropolitan centers (the San Francisco Bay area, Seattle and Washington). Note that the remote control functionality in the system of the invention does not require a high data rate. The information communicated is limited in size. The data rate in this example is approximately 9,600 Baud. System 100 further has a server 108, an X-10 controller 110, an X-10 switch module 112 and a lamp 114. X-10 is a communications protocol for control of electrical devices. The protocol is designed for communications between X-10 transmitters and X-10 receivers which communicate on standard household wiring 116. X-10 is mentioned here as an example. Alternative control mechanisms are feasible that do not use the power supply lines, such as CEBus, I2C, IR (through an IR blaster), etc. Switch 112 connects lamp 114 to main power supply 116 under control of controller 110. Controller 110 in turn gets its control input from server 108.

PDA 102 has a display 118 with a touch screen or graphical tablet functionality, and a client application 120. Client application 120 controls the creation of soft buttons on display 118. Assume that application 120 is activate on PDA 102. When user activates an ON-button on display 118, application 120 uses wireless modem 104 to send a command via the Internet 106 to server 108.

Server 108 comprises in this example a PC hardware running an Apache web server 122. The Apache is a public-domain Web server. Its first version was developed in 1995 based on the NCSA httpd Web server. The name "Apache" stems from the fact that it was developed from existing NCSA code plus various patches. Accordingly, it was referred to as a patchy server, hence the name Apache Server. The Apache has become the world's

most popular Web server because of its high performance, sophisticated features, and because of the fact that its source code is available for free.

Server 108 further comprises software modules 124 that comprise CGI scripts run by Apache server 122. CGI stands for "Common Gateway Interface" and is as  
5 specification for transferring information back and forth between a Web server and an application. CGI is part of the HTTP protocol.

Apache server 122 running on PC 108 interprets the command received from PDA 102 over the Internet 106. The interpretation mechanism uses, e.g., a data base on PC 108, wherein each specific command received is linked to a specific action. The data base  
10 can be fully customized by the user. The command in this example is interpreted as an action to turn on lamp 114. To this end, PC communicates with controller 110, e.g., via RS232, and instructs the latter to issue a command to switch 112 to turn lamp 114 on. Switch 112 receives the command and connects lamp 114 with power lines 116. Similarly, when the user thereafter presses an OFF-button on PDA 102, client application 120 sends a corresponding  
15 command via modem 104 to PC 108 via the Internet 106. Apache server 122 interprets the command and instructs controller 110 to let switch 112 turn off lamp 114.

System 100 further comprises a server 126, herein referred to as the Reliable Home Server (RHS) and a camera 128. RHS 126 may be a component within server 108 or a separate low-cost server, as in this example. Alternatively, web server 122 and scripts 124  
20 can be components of server 126. RHS 126 comprises hardware and software to retrieve images from a video source, in this example, a still image from video camera 128. Client application 120 provides a soft button "VIEW" that, when pressed, let application 120 send a command via modem 104 and the Internet 106 to server 108. Apache server 122 running on PC 108 receives the command, interprets it and instructs RHS 126 to retrieve a still image and return it to Apache server 122. The latter converts the format of the still image suitable  
25 for display on GUI 118 of PDA 102 and then stores the formatted image in a data base on PC 108. The user presses another soft button "UPDATE" created by client application 120. The associated command gets send via modem 104 and the Internet 106 to PC 108. Apache server 122 receives the command, interprets it, and accordingly retrieves the stored image from the database and returns it to PDA 102 via common Internet protocols. PDA 102 then displays  
30 the image on GUI 118 under control of client application 120.

Above, the remote control over the Internet has been explained with reference to some conceptually simple examples. It is clear that other and more sophisticated scenarios can be implemented using the invention. For example, a recording device such as a VCR or

TiVo can be programmed from anywhere in the world when the user realizes that he/she has forgotten or was unable to set the device to record a favorite TV program. Within this context, also see U.S. serial 09/283,545 (attorney docket PHA 23,633) filed 4/1/99 for Eugene Shteyn for TIME-AND LOCATION-DRIVEN PERSONALIZED TV, herein  
5 incorporated by reference. As another example, the user may turn on the central heating and turn on the lights at home and in the garden while returning home by car late at night. As another example, the user may program or activate the sprinkler installation in the garden at home while at work or traveling.

## CLAIMS:

1. An information processing system (100) comprising:

- a handheld device (102) for providing a user-interface;
  - a wireless modem (104) for coupling the handheld device to a data network (106);
  - a server (108; 126) for communicating with the handheld device through the modem via the
- 5 data network; and
- a controllable CE sub-system (114) coupled to the server;

wherein:

- the handheld device is enabled to function as a user-controllable remote control unit for the CE equipment (114) via the data network and the server.

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2. The system of claim 1, wherein:

- the handheld device comprises a client software application (120) for enabling the device to send a user-input to the server; and
  - the server comprises software (124) for interpreting the user-input received via the data
- 15 network and for issuing a corresponding command to the CE equipment based on the user-input.

3. The system of claim 1, wherein:

- the system comprises an apparatus (128) for capturing information content;
- the apparatus is coupled to the server;
- the handheld device is enabled to receive the information content under user control from the server via the data network and the wireless modem.

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4. The system of claim 3, wherein:

- the information content comprises a still image;
- the handheld device comprises a GUI;
- the server has software to format the still image as to enable display on the GUI upon sending the formatted information content to the handheld via the data network upon user request.

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5. A method of enabling a user to remotely control a CE apparatus (114), the method comprising:

- enabling the user to send a command from a handheld device (102) via a wireless modem (104) to a data network (106);
- enabling a server (108; 126) coupled to the apparatus to receive the command from the data network for effecting control of the CE apparatus (114).

6. For use on an information processing system (100), wherein the system comprises:

- a handheld device (102) for providing a user interface;
  - a wireless modem (104) for coupling the handheld device to a data network (106);
  - a server (108; 126) for communicating with the handheld device via the modem over the data network;
  - controllable CE equipment (114; 128) coupled to the server; and wherein:
  - the handheld device is enabled to function as a user-controllable remote control unit for the CE equipment via the data network and the server:
- a client application (120) for running on the handheld device for processing user-input and sending the user-input via the data network to the server.

7. The client application of claim 6, wherein:

- the handheld device comprises a GUI (118); and
- the client application is capable of enabling a user to retrieve from the server content information captured at the CE equipment.

8. For use on an information processing system, wherein the system comprises:

- a handheld device (102) for providing a user-interface (118);
- a wireless modem (104) for coupling the handheld to a data network (106);
- a server (108; 126) for communicating with the handheld device via the modem over the data network;
- a control network (110; 126) coupled to the server;
- controllable CE equipment (114, 110; 128) coupled to the server; and wherein:
- the handheld device is enabled to function as a user-controllable remote control unit for the CE equipment via the data network and the server:



software (124) for running on the server to interpret a user-input received from the handheld over the data network and to generate a control command for the CE equipment.

9. The software of claim 7, wherein the software is user-programmable for  
5 associating a specific user-input to a specific control command for the CE equipment.
10. The software of claim 8, wherein:  
- the handheld has a GUI (118), and  
the software is capable of processing content information captured at the CE equipment for  
10 communicating the content information to the handheld via the data network.
11. A remote control device (102&104) comprising:  
- a user-interface (118) for enabling a user to enter an input; and  
- a wireless modem (104) for enabling remote control via the Internet upon the input.

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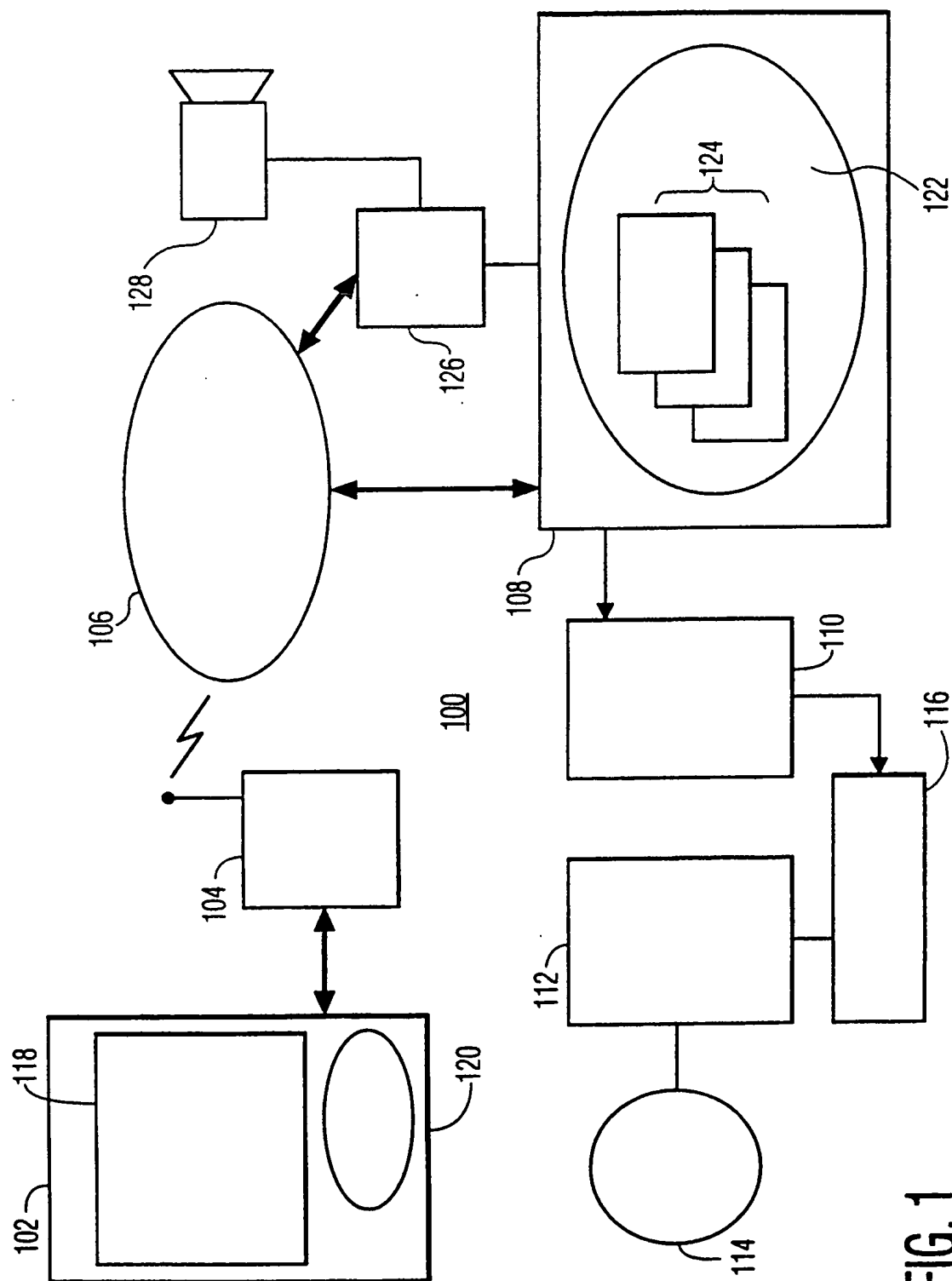


FIG. 1

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 00/09083

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 H04L29/06

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	US 5 086 385 A (LAUNEY ET AL.) 4 February 1992 (1992-02-04) column 8, line 25 - line 29 column 15, line 2 - line 8 abstract; figure 1 ---	1-3, 5, 6, 8, 10 4
X A	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 12, 29 October 1999 (1999-10-29) & JP 11 196479 A (TOSHIBA CORP.), 21 July 1999 (1999-07-21) abstract --- -/--	1, 2, 5, 6, 8  4, 7, 10, 11

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## \* Special categories of cited documents:

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Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl.  
Fax: (+31-70) 340-3016

Authorized officer

Taylor, P

# INTERNATIONAL SEARCH REPORT

Internat Application No

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X P,A	WO 00 43891 A (3COM CORP.) 27 July 2000 (2000-07-27) page 6, line 21 -page 8, line 35 page 9, line 31 - line 35 page 54, line 23 - line 29; figures 1-3 ---	1-3,5,6, 8 4,7,9-11
E	EP 1 045 302 A (NELES FIELD CONTROLS OY) 18 October 2000 (2000-10-18) column 3, line 35 -column 5, line 15; figures 1,2 -----	1-11

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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WO 0043891 A	27-07-2000	NONE	
EP 1045302 A	18-10-2000	FI 990864 A	17-10-2000